Exhibit 4

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

COBBLESTONE WIRELESS, LLC, *Plaintiff*, v. T-MOBILE USA, INC. *Defendant*, NOKIA OF AMERICA CORPORATION, ERICSSON INC. *Intervenors*.	§	CASE NO. 2:22-cv-00477-JRG-RSP (Lead Case) JURY TRIAL DEMANDED
COBBLESTONE WIRELESS, LLC, *Plaintiff*, v. AT&T SERVICES INC.; AT&T MOBILITY LLC; AT&T CORP., *Defendants*, NOKIA OF AMERICA CORPORATION, ERICSSON INC. *Intervenors*.	§	CASE NO. 2:22-cv-00474-JRG-RSP (Member Case) JURY TRIAL DEMANDED
COBBLESTONE WIRELESS, LLC, *Plaintiff*, v. CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS, *Defendant*, NOKIA OF AMERICA CORPORATION, ERICSSON INC. *Intervenors*.	§	CASE NO. 2:22-cv-00478-JRG-RSP (Member Case) JURY TRIAL DEMANDED

DECLARATION OF JAMES A. PROCTOR

Pursuant to 28 U.S.C. § 1746, I, James A. Proctor, declare as follows:

1. I have been asked to provide an opinion concerning certain language that appears in U.S. Patent Nos. 8,891,347 ("the 347 Patent"), 9,094,888 ("the 888 Patent") and 10,368,361 ("the 361 Patent") (collectively, the "Asserted Patents"), and to rebut, if necessary, any statements or opinions by Plaintiff's expert with which I disagree. I have reviewed the Asserted Patents, as well as their respective prosecution histories. I have also reviewed extrinsic evidence regarding the patents, including extrinsic evidence which I understand Plaintiff has alleged is relevant to the construction of certain terms. If called upon, I would be willing to testify as set forth in this Declaration.

I. PROFESSIONAL BACKGROUND

2. My background and expertise that qualify me as an expert are described in detail in my *Curriculum Vitae* attached as **Attachment A**, which further includes an accurate list of all publications authored by me in the previous 10 years and a list of all cases in which I testified as an expert at trial or by deposition during the previous 4 years. Below I have summarized those qualifications, as well as any other background and expertise relevant to the technical issues in this case:

3. My educational background includes a Bachelor of Science in Electrical Engineering (BSEE) from the University of Florida in 1991 and Master of Science in Electrical Engineering (MSEE) from the Georgia Institute of Technology ("Georgia Tech") in 1992 focusing on digital signal processing.

4. I have worked as an engineer and entrepreneur in the field of wireless communications for over 25 years and have been involved with various aspects of wireless communications for the duration of my career.

5. From 1986 to 1991, while at the University of Florida, I interned with Harris Corporation in various roles including mechanical design, software development, and digital design. From 1991 to 1992, while at Georgia Tech, I worked at the Georgia Tech Research Institute (GTRI) as a graduate research assistant, performing software development on classified government programs.

6. From 1993 to 1995, while working for Harris Corporation, I designed various cellular communication systems for voice, data, and tracking/location. Many of these systems I designed utilized advanced communications technologies, such as those utilized in the then-developing and future telecommunications (such as IS95, W-CDMA, and aspects of LTE).

7. From 1995 to 1998, I worked at Spectrian in advanced development and technical marketing. At Spectrian, I interfaced with Nortel's and Qualcomm's product management and performed advanced technology development and systems analysis. In this role, I designed IS-95 CDMA and GSM base station power amplifiers and control electronics, and received several patents associated with advanced linearization techniques for the reduction of transmitted distortion. I note that the peak to average ratio of various waveforms was of particular concern in the design of the power amplifiers and associated linearization techniques with the designs I was involved with during my work at Spectrian.

8. From 1998 to 2002, I served as the Director of Strategic and Technical Marketing at Tantivy Communications, a venture capital-funded 3G cellular data and chip set company. At Tantivy, I helped to architect and standardize the I-CDMA Spread Spectrum Systems Air Interface Standard (T1P1.4). I also developed both wireless access terminals and base stations that complied with the standard. The base stations utilized various IP protocols, and interfaced with the wire line network utilizing IP over Ethernet. Additionally, I participated in and provided technical

contributions to 3GPP/3GPP2 standardization efforts related to the development of CDMA2000 and 1xEV-DO. This work resulted in me being a named inventor on more than 150 pending or issued U.S. patents or applications.

9. From 2002 to 2007, as co-founder of WiDeFi, Inc., I served in various roles including President, CEO, CTO, and board member. As the CEO, my responsibilities included advanced development of platform technologies. I was a named inventor of wireless technology components, including a frequency translating TDD repeater, a same frequency repeater architecture for TDD/FDD- based systems, and physical layer multi-stream MIMO repeater technology. WiDeFi invented and pro-vided wireless home networking products based on WiFi and cellular technologies. While at WiDeFi, I was a named inventor on over 25 issued U.S. patents or patent applications.

10. From 2007 to 2009, I consulted as a principal engineer for Qualcomm Inc. as part of the acquisition of WiDeFi's technology. While at Qualcomm, I worked with its corporate R&D division and developed consumer 3G and 4G cellular coverage enhancement systems utilizing WiDeFi's baseband interference cancellation technologies. My responsibilities included working with international cellular operators on product requirements, detailed W-CDMA simulations, Long Term Evolution ("LTE") systems analysis, and participation in prototype product realization. I am currently a named inventor on roughly 45 issued U.S. patents or patent applications assigned to Qualcomm.

11. From 2010 to the present, I have served as managing director and co- founder of Proxicom Wireless, LLC, which has developed and continues to develop cloud-based, mobile social networking and mobile payments technology based upon the proximity and location of mobile devices. Proxicom currently holds twelve issued U.S. patents and multiple pending patent

applications, of which I am a named inventor. Significant aspects of Proxicom's technology involve a mobile device's use of short range wireless technologies (802.11, near field communications, Bluetooth) in combination with cellular data links (3G/WCDMA or 4G/LTE, for example) to facilitate frictionless interactions via a wireless networked central cloud server.

12. Since 2007, I have also been the principal of Proctor Consulting, LLC. In this role, I have been a consultant relating to wired, wireless, and cellular communication and technologies, start-up companies and intellectual property. I have also been involved with numerous patent infringement, patent validity, and patent analysis assignments for public and private companies in the wired, wireless, and cellular networking industries.

13. Additionally, I have worked and consulted for both cellular infrastructure and device focused companies (Spectrian, Qualcomm, Fastback Networks), and defense contractors (Harris Corporation), where I developed covert- tracking and location technologies involving CDMA and smart-antenna technologies.

14. In various of the above-detailed roles, I have been responsible for the development of business plans, product development plans, product development budgets, and product bill of materials estimations. I have been responsible for numerous product development teams, including schedule and costs of the development process at various stages of my career. For example, at Tantivy Communications, I ran a joint development of I-CDMA cellular base stations in Seoul, Korea that were used in a field trial in that country. Additionally, as founder and CEO of WiDeFi, Inc., I was responsible for similar such activities, as required to raise venture capital funding and reporting to the board of directors.

15. I am currently a named inventor on more than 325 issued U.S. patents, and more than 700 international patent publications in total. A substantial portion of my work has focused on

wireless communication systems and products. A number of these patents and patent applications are related to the subject matter of the patents asserted in this matter. For example, the following patents, for which I am a named inventor, are examples of some of my experience relevant to the subject matter of this declaration:

U.S. Patent No.	Title	Priority Date
8,321,542	"Wireless channel allocation in a base station processor"	May 5, 2000
7,002,902	"Method and system for economical beam forming in a radio communication system"	Feb. 23, 2000
6,400,317	"Method and apparatus for antenna control in a communications network"	Feb. 2, 2001
8,259,687	"Dynamic bandwidth allocation for multiple access communications using buffer urgency factor"	June 31, 2001
11,443,344	"Efficient and secure communication using wireless service identifiers"	Sept. 8, 2008
8,477,665	"Method in a wireless repeater employing an antenna array for interference reduction"	July, 14, 2010
9,135,612	"Proximity detection, virtual detection, or location based triggering of the exchange of value and information"	Apr. 17, 2011
8,502,733	"Transmit co-channel spectrum sharing"	Feb. 10, 2012
8,422,540	"Intelligent backhaul radio with zero division duplexing"	Sept. 10, 2012

16. I am currently consulting, working with and/or advising a number of companies and universities. For example, I currently serve on the external advisory board to the University of Florida's Electrical and Computer Engineering department. I also perform expert consulting work, research, and development in the area of wireless communications with Proctor Consulting and Proxicom wireless. Finally, I perform conceptual and product development in the medical device field with Genesis Medical Devices.

17. Based on my professional experience, I believe I am qualified to testify as an expert on matters related to the patent at issue.

II. PERSON OF ORDINARY SKILL IN THE ART

18. All of the opinions I express in this Declaration regarding the Asserted Patents have been made from the standpoint of a person of ordinary skill in the field of the Asserted Patents at the time of the purported inventions.

19. Based on the materials and information I have reviewed and based on my experience in the technical areas relevant to each of the Asserted Patents, a person of ordinary skill in the art at the time of the alleged invention of each of the Asserted Patents[1] would have had had at least a bachelor's degree in electrical engineering, computer engineering, computer science, physics, or the equivalent, and at least two years of experience working in the field. Relevant working experience would include experience with cellular telecommunications and networking, radio-access networking architectures, protocols, and signal propagation in wireless networks. More education can supplement practical experience and vice versa. Based on my knowledge and experience, including as discussed above in Section I, I was a person of ordinary skill in the art at the time of the alleged invention of each Asserted Patent, which ranges from 2011 to 2014, and can provide opinions regarding the knowledge of a person of ordinary skill in the art as of that time. My opinions herein are, where appropriate, based on my understanding as to a person of ordinary skill in the art at that time. I myself had these capabilities at the time of the alleged inventions of the Asserted Patents between 2011 and 2014.

[1] I understand that Plaintiff alleges the following earliest possible priority dates for each Asserted Patent, which I use for my analysis herein:
(1) July 28, 2011 is alleged by Plaintiff to be the earliest possible priority date of the 347 Patent.
(2) April 29, 2011 is alleged by Plaintiff to be the earliest possible priority date of the 888 Patent.
(3) August 1, 2014 is alleged by Plaintiff to be the earliest possible priority date of the 361 Patent.

III. CLAIM CONSTRUCTION

A. The 347 Patent

i. "the channel estimation that includes the path parameter information" (Claims 1, 8, 15)

Claim Term	Defendants' Construction	Cobblestone's Construction
"the channel estimation that includes the path parameter information" Claims 1, 8, 15	Plain and ordinary meaning	No construction necessary; plain and ordinary meaning; not indefinite under 35 U.S.C. § 112.

20. I understand the parties agree this term has its plain and ordinary meaning, but dispute whether "the result of the channel estimation" falls under the plain and ordinary meaning of the term "channel estimation."

21. The claims require "the channel estimation" be performed. In all but claim 15, it is an express requirement of the claim:

> **1.** A method for wireless communication in a system including a transmitter, a receiver, and a plurality of propagation paths formed between the transmitter and the receiver which are capable of carrying a signal transmitted by the transmitter to the receiver, the method comprising:
>
> transmitting a first signal from the transmitter to the receiver via a first propagation path of the plurality of propagation paths;
>
> receiving the first signal at the receiver;
>
> ***performing a channel estimation*** based on the first signal to obtain path parameter information of the first propagation path;
>
> sending the channel estimation that includes the path parameter information from the receiver to the transmitter via the first propagation path;
>
> predistorting a second signal at the transmitter in a time domain, a frequency domain, and a spatial domain, according to the channel estimation based on the first signal;
>
> transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path; and
>
> receiving the predistorted second signal at the receiver.

8. A system for wireless communication comprising:

a receiver,

a transmitter; and

a plurality of propagation paths formed between the transmitter and the receiver which are capable of carrying a signal transmitted by the transmitter to the receiver,

wherein the receiver is configured to receive a first signal that is transmitted along a first propagation path of the plurality of propagation paths from the transmitter, ***perform a channel estimation*** based on the first signal to obtain path parameter information of the first propagation path, and send the channel estimation that includes the path parameter information to the transmitter via the first propagation path, and

wherein the transmitter is configured to predistort a second signal in a time domain, a frequency domain, and a spatial domain according to the channel estimation that is based on the first signal and received from the receiver and to transmit the predistorted second signal to the receiver via the first propagation path.

19. A wireless device for performing wireless communication with a base station with a transmitter via a plurality of propagation paths, the wireless device comprising:

a receiver,

a computing device; and

a computer-readable storage medium having computer executable instructions stored thereon that are executable by the computing device to perform operations comprising:

receiving a first signal at the receiver via a first propagation path of the plurality of propagation paths;

performing a channel estimation based on the first signal to obtain path parameter information of the first propagation path;

sending the channel estimation that includes the path parameter information to the transmitter, and receiving a second signal via the first propagation path, the second signal predistorted in a time domain, a frequency domain, and a spatial domain according to the channel estimation based on the first signal.

22. The specification likewise repeats that the channel estimation be performed because it is a "method," "algorithm" or a "technique" or the like.

- "*Performing* a channel estimation." 347 Patent at Fig. 1.
- "a channel estimation of a first signal is *performed*." *Id.* at 8:5.

- "channel estimation *algorithm* is performed." *Id.* at 8:12.
- "Various channel estimations may be used, including the SAGE *algorithm*. Other *algorithms* for estimating the parameters include Maximum likelihood estimation *algorithms* including the specular-path-based maximum likelihood *method*." *Id.* at 8:17-21.
- "Other examples of *channel estimations which may be used* include Spectral-based *methods*, including the Bartlett beamformer, the Capon beam former, and the MUSIC (Multiple Signal Classification) *method*. These *methods* are used to compute the power spectrum of the channel in multiple dimensions, e.g. in the delay, Doppler frequency and directions. These *methods* can return estimates of the path parameters with low complexity. They are practical and much more appropriate for real implementation than the maximum-likelihood based estimation *methods*." *Id.* at 8:26-35.
- "Still another channel estimation *algorithm* which may be used in association with the non-spectral-based method are subspace-based *techniques*, such as the root-MUSIC *technique*, and the ESPRIT (Estimation of Signal Parameters based on Rotational-Invariance Technique) *algorithm*, as well as the extension of these algorithms, e.g. Propagator *method* and Unitary-ESPRIT technique. These *algorithms* have high accuracy, but because the input of these *algorithms* are the observations of channel from multiple independent snapshots in order to avoid the singularity issue of the covariance matrix of received signals, data must be collected from multiple frames in a relatively long time window." *Id.* at 8:36-47.

- "Approximation of the maximum-likelihood *method* based on iterative schemes may also be used at step 410. These *algorithms* include the expectation-maximization (EM) *method*, the space-alternating generalized Expectation-maximization (SAGE) *technique* and the so-called RiMAX (Richter's maximum likelihood estimation) *method*." *Id.* at 8:48-53.

23. A POSITA reading the claims of the and specification of the 347 Patent would understand that channel estimation is an algorithm or a method.

24. The next steps of the claim require sending the channel algorithm or method, as well as the result of the algorithm or method (the path parameter information) back to the base station.

- Claim 1: "sending ***the*** channel estimation that includes the path parameter information;"
- Claim 8: "send ***the*** channel estimation that includes the path parameter information;"
- Claim 15 (on the base station side): "receiving a channel estimation based on the first signal, ***the*** channel estimation including path parameter information;"
- Claim 19: "sending ***the*** channel estimation that includes the path parameter information."

25. I understand when a claim uses the word "the" as the antecedent basis, it is referring back to the previous use of the same term. In this instance, sending ***the*** channel estimation means sending the algorithm, method, or technique that was just performed back to the base station. Here, the claim language's use of "the" requires that no other interpretation (such as "the result of the channel estimation") can be used. Thus, the channel estimation itself must be sent back.

26. A POSITA would understand that one reason to send the algorithm to the base station is so the base station knows the algorithm used for the channel estimation, which might allow the base station to better understand how the path parameter information was calculated.

B. The 888 Patent

27. The 888 Patent is titled, "Wireless Handoff Between Wireless Networks" and discloses methods, apparatuses and systems to facilitate wireless device handoff between a first and second wireless network. 888 Patent at 3:27-30. Figure 1A below illustrates the concepts from the 888 Patent.

888 Patent at Fig. 1A (annotated).

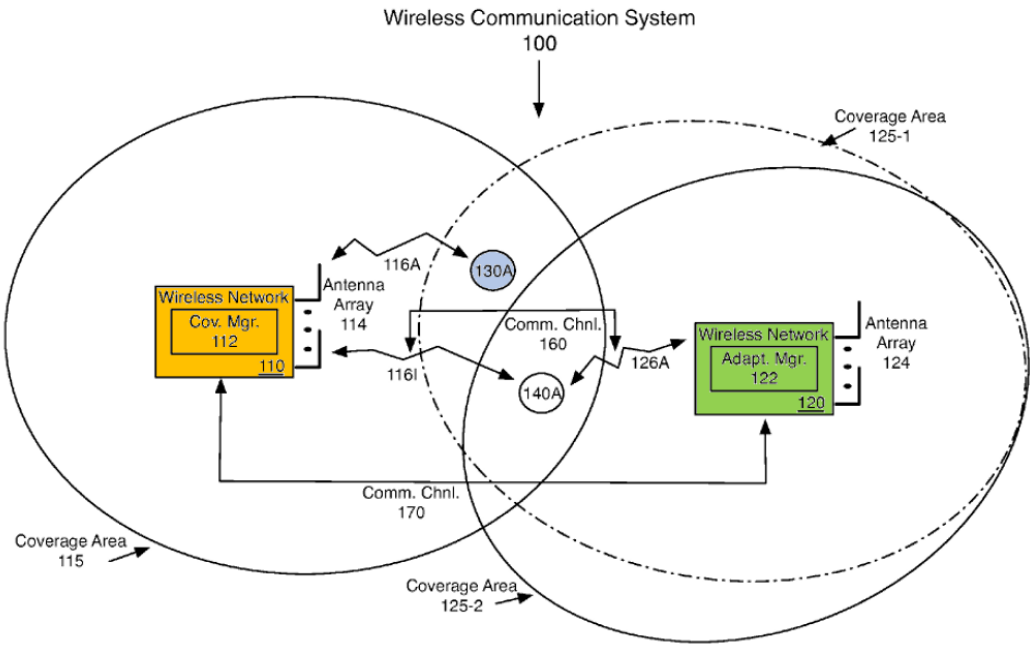


FIG. 1A

28. As shown above in orange and green respectively, there are two wireless networks (also referred to as base stations, *see* 888 Patent at 4:30-32) labeled 110 and 120, shown. The wireless devices (*e.g.*, UEs) labeled 130A (for example) are shown in blue.

29. The wireless device (UE) is connected to the source network and will be handed off to the target network. The claims label the source network as the "second wireless network" and the target network as the "first wireless network."

888 Patent at Fig. 1A (annotated).

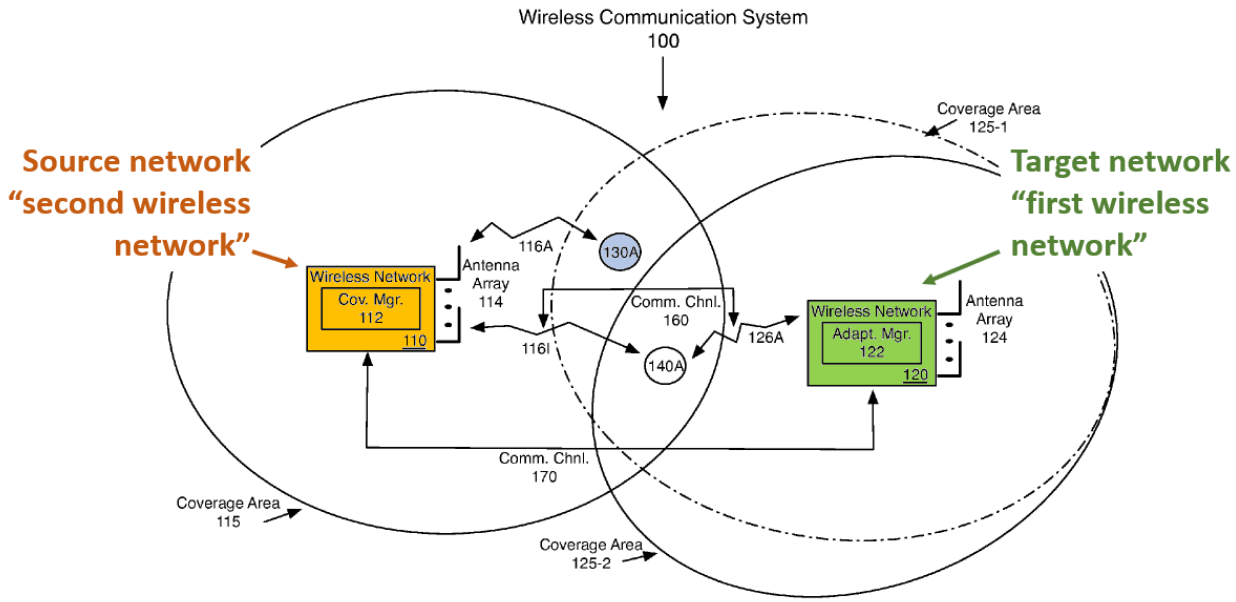


FIG. 1A

30. The wireless network 120 (in green) has two potential "coverage areas" 125-2 (shown by a solid line in the figure above) and 125-1 (shown by a dashed line in the figure above). These two coverage areas are illustrated below in cross stripes:

888 Patent at Fig. 1A (annotated).

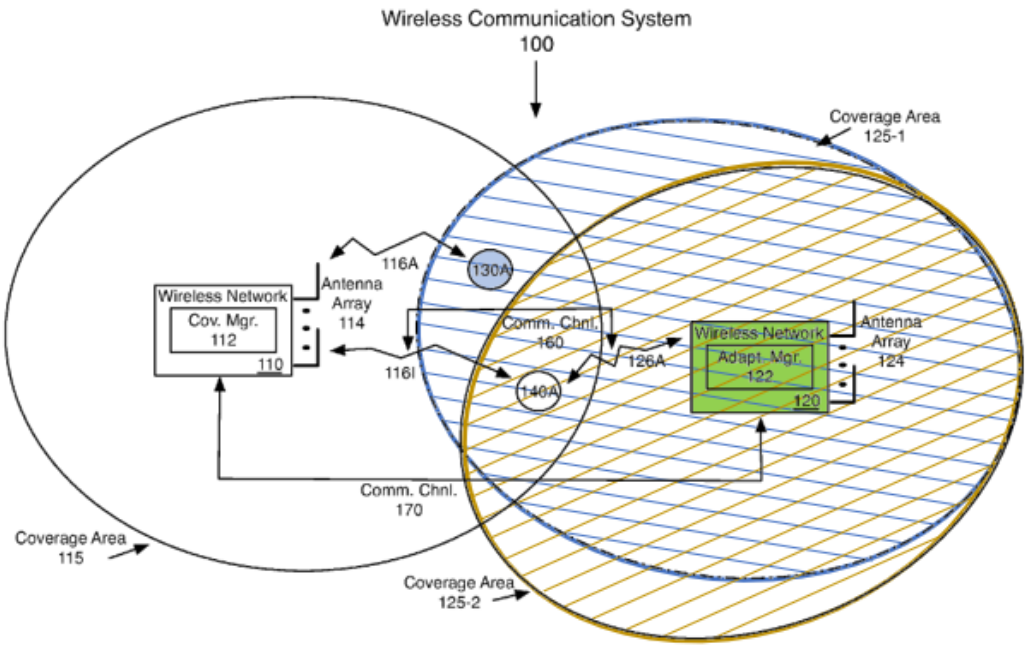


FIG. 1A

31. In Figure 1A, the target wireless network is operating with coverage area 125-2 (in orange). UE 130A (shown in blue) is not covered by coverage area 125-2 (in orange). 888 Patent at 5:35-38. To facilitate the handover, the 888 Patent describes that the target network must adapt its coverage area to 125-1 (in blue cross stripes) to cover the UE 130A. To adapt its coverage area, the 888 Patent describes adapting one or more beams of an antenna array to match coverage area 125-1.

32. To aid in this process, the 888 Patent then describes how network managers (*e.g.*, "coverage manager 112" and "adaption manager 122") negotiate and exchange information such as "coverage maps" so that "coverage manager 112 may be configured to determine that wireless device 130A . . . may be *capable* of being covered by wireless network 120 based at least on the coverage map." 888 Patent at 6:1-5 (emphasis added).

33. Based on the negotiation, the source wireless network 110 (the "second" wireless network of the claims) determines that the target wireless network 120 is capable of covering UE 130A and transmits a handoff request to wireless network 120 (the "first" wireless network of the claims). 888 Patent at 6:22-24. From there, "adaption manager 122 of wireless network 120" may "receive the handoff request and determine whether to adapt antenna array 124 to facilitate coverage of wireless device 130A." 888 Patent at 6:26-31.

i. "adaption manager" (Claim 20)

Claim Term	Defendants' Construction	Cobblestone's Construction
"adaption manager"" Claim 20	Indefinite under § 112, ¶6	No construction necessary; plain and ordinary meaning; not indefinite under 35 U.S.C. § 112; not subject to means-plus-function treatment under 35 U.S.C. § 112(f).

34. I understand that the parties dispute the meaning of "adaption manager," which appears in claim 20 of the 888 Patent.

35. I understand that the Plaintiff contends that this term should receive its plain and ordinary meaning, but "adaption manager" does not have a customary, or plain and ordinary, to one skilled in the art and the Plaintiff cites to no extrinsic evidence or support for any specific plain and ordinary construction.

36. I understand that the Defendants contend that this term should be found indefinite under § 112, ¶ 6, which I further understand to govern "means-plus-function" terms. I understand that a means-plus-function term requires that a corresponding structure be disclosed in the specification and also linked to the function, and that the corresponding structure be capable of performing the entirety of the function.

37. Having considered the parties' contentions, and based on my review of the claim language in the context of the specification and the prosecution history, it is my opinion that the

term is functional in nature and a POSITA would not have understood "adaption manager" to carry any meaning which connotates a structure, much less a sufficiently definite structure for performing the claimed receiving, causing, and transmitting functions.

a) The "adaption manager" term is a functional term.

38. Claim 20 of the 888 Patent, which contains the "adaption manager" term, is reproduced below.

> 20. A system for a wireless device handoff between a first wireless network and a second wireless network, the system comprising:
>
> an antenna array configured to generate one or more adaptable beams to modify a coverage area for the first wireless network; and
>
> ***an adaption manager having logic, the logic configured to****:*
>
> > receive a handoff request from the second wireless network, the handoff request based, at least in part, on a determination by the second wireless network that the wireless device is capable of being covered by the first wireless network,
> >
> > cause a beam from among the one or more adaptable beams to be adapted in order to enable the wireless device to be covered by the first wireless network, and
> >
> > transmit a confirmation to the second wireless network to indicate acceptance of the handoff request, wherein the wireless device is handed off from the second wireless network to the first wireless network.

39. The claimed "adaption manager" performs at least the three specific functions of (1) "receiv[ing] a handoff request from the second wireless network"; (2) "caus[ing] a beam . . . to be adapted in order to enable the wireless device to be covered by the first wireless network"; and (3) "transmit[ting] a confirmation to the second wireless network" indicating acceptance of the handoff request. 888 Patent, cl. 20. As the claim suggests, the "adaption manager" performs these three functions via programmed logic. *See* 888 Patent, 2:14-26.

40. I understand that the Plaintiff does not identify any extrinsic evidence in its P.R. 4-2 disclosures that define the term "adaption manager" in the art at the time of patenting. In light of

this, a POSITA would not have understood "adaption manager" to be anything more than an abstraction, or a "means," for performing its three claimed functions. "Adaption manager" is a generic placeholder that would retain the same meaning if it were replaced with other nonce words, like "means," "module," "device," etc. The "adaption" prefix fails to impart any structural significance to the term. The "manager" is a means for implementing what the patentee has defined as the "adaption" operation achieved through implementing the required receiving, causing, and transmitting functions.

41. Figure 3 of the 888 Patent depicts an exemplary "adaption manager" comprised of elements that are "configured to support or enable adaption manager 122" by carrying out logic or implementing an algorithm to perform the functions claimed in claim 20. Each of adaptation manager 122 and the adapt logic 310 are nothing more than a black box.

888 Patent at Fig. 3 (annotated).

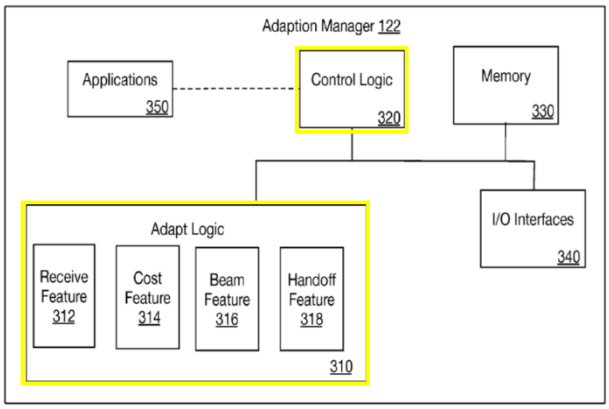


FIG. 3

42. For example, the "adaption manager 122 includes features and/or logic configured or arranged for a handoff of a wireless device between wireless networks (e.g., wireless networks 110 and 120)." 888 Patent, 9:1-5. The depicted "adapt logic 310 and control logic 320 may separately or collectively represent a wide variety of logic device(s) to implement the features of

adaption manager 122." 888 Patent, 9:20-23. The specification supports the functional nature of the "adaption manager," explaining that its internal "logic device(s)" perform various functions, such as: (i) implementing a wireless device handoff between wireless networks (*see* 888 Patent, 9:29-45; 12:23-36), receiving a handoff request (*see* 888 Patent, 12:37-41); (ii) determining whether to adapt the coverage area for a wireless network (*see* 888 Patent, 12:48-51); (iii) adapting one or more beams generated from or by an antenna array to facilitate coverage of a wireless device (*see* 888 Patent, 12:64-13:2); (iv) transmitting a confirmation to indicate acceptance of a handoff request from a wireless network for a wireless device (*see* 888 Patent, 13:9-13); (v) and/or handing off a wireless device from a wireless network (*see* 888 Patent, 13:19-22).

43. Thus, in my opinion "adaption manager" (or "an adaption manager having logic, the logic configured to") is functional in nature.

b) The "adaption manager" term is indefinite because the specification lacks adequate disclosure of the corresponding structure

44. The 888 Patent specification does not provide a structure corresponding to the "adaption manager" term, and a POSITA would not understand the term to have any sufficiently definite structure.

45. Although "adaption manager" is referenced throughout the 888 Patent's specification, the disclosures do not impart any structural significance to the term. The specification only describes "adaption manager" in functional terms, rather than particularly pointing out a particular structure associated with performing the associated functions. In particular, the "adaption manager" programmed to carry out the functions recited in the claims would need to be implemented in a special purpose computer, but all that is recited in the specification as "example logic device[s]" are "one or more of a computer, a microprocessor, a microcontroller, a field programmable gate array (FPGA), an application specific integrated circuit

(ASIC), a sequestered thread or a core of a multi-core/multi-threaded microprocessor or a combination thereof." 888 Patent at 9:23-28.

46. A POSITA would not find this to be sufficiently definite structure.

47. Moreover, some disclosures describe potential locations for the "adaption manager." *See* 888 Patent, 5:18-25 ("[A]daption manager 122 may be co-located with a base-station associated with wireless network 120. Also, in other examples, adaption manager 122 may be located with control elements that may remotely manage and/or control wireless network 120. For these other examples, adaption manager 122 may be located remote to antenna array 124, which provides coverage areas 125-1 and 125-2 for wireless network 120."). Describing the location of the adaption manager does not provide any sufficiently definite direction to a POSITA about the specially programmed computer.

48. Other disclosures use functional language to explain that the "adaption manager" performs functions, but the specification leaves entirely unanswered how it does so. *See* 888 Patent, 12:23-26 (explaining that the "adaption manager" can illustrate example "methods implemented at a wireless network (e.g., wireless network 120) for a wireless device handoff between another wireless network (e.g., wireless network 110) and the wireless network"); *see also* 888 Patent, 12:37-47 (explaining that "adaption manager 122 of wireless network 120 may include logic and/or features configured to receive a handoff request from wireless network 110 (e.g., via receive feature 312)"); *see also* 12:37-13:28 (similarly disclosing the function that the "adaptation manager" can perform); 8:65-10:14 (same). The disclosures regarding "adaption manager" in the 888 Patent are nothing more than a restatement of the function, as recited in the claim.

49. In sum, no algorithmic structure is set forth in the specification for implementing the operations of the claimed "adaption manager."

50. In sum, the 888 Patent does not provide any structure, logic, process, or algorithm that can be linked to and/or capable of performing the claimed receiving, causing, and transmitting functions. Based on the specification's lack of disclosure, a POSITA would not be able to recognize and implement any the structure for the "adaption manager."

51. Thus, it is my opinion that "adaption manager" would not be understood by a POSITA to have a sufficiently definite meaning as the name for structure, and the specification is provides no clarity on the algorithm for the logic of the "adaption manager."

ii. "predetermined network load" (Claim 12)

Claim Term	Defendants' Construction	Cobblestone's Construction
"predetermined network load" Claim 12	Indefinite	No construction necessary; plain and ordinary meaning; not indefinite under 35 U.S.C. § 112.

52. I understand that the parties dispute the construction of "predetermined network load," which appears in claim 12 of the 888 Patent.

53. I understand that the Plaintiff contends that this term should receive its plain and ordinary meaning but in the context of the 888 Patent a POSITA at the time of the 888 Patent would have no known or common understanding of a predetermined network load.

54. The term appears in claim 12 below:

> A method according to claim 9, wherein the adapting one or more beams comprises adapting one or more beams based, at least in part, on **one of a predetermined network load** placed on the first wireless network due to the handoff of the wireless device or an effect of adapting one or more beams on other wireless devices currently communicatively coupled to the first wireless network.

55. In the claims of the 888 Patent, the UE is handed off from a "second network" to a "first network." Therefore, in the claim the beams must be adapted based at least in part on one of a predetermined network load placed on the first wireless network due to the handoff.

56. A POSITA would not have understood how adapting the beam in a target network (the "first network") could be based on a "predetermined network load . . . due to the handoff of the wireless device." A POSITA would have understood that the term "predetermined" means the determination must be performed before the handover takes place. However, in the context of the claim, a POSITA would not understand how adapting the beam based on a predetermined network load due to the handoff could be determined before the handoff.

57. The specification states the system could include features "configured to predetermine criteria such as what network load would be placed on [target] wireless network 120 if wireless device 130A was handed off from wireless network 110." 888 Patent, 6:63-66. However, the claim does not mention predetermining criteria about network loads that would be placed on the target wireless network if the wireless device was handed off. Instead, the claim discusses adapting one or more beams based on one of a predetermined network load placed on the first wireless network due to the handoff. In other words, the beams are adapted based on a predetermined network load, which simply makes no sense in the context of the specification description.

58. Likewise, in a portion of the specification, the 888 Patent states "[m]emory 330 may also be arranged to temporarily maintain information associated with determining whether to accept a handoff request (e.g., predetermined network loads)." 888 Patent, 9:50-53. Again, this section talks about whether to accept a handoff request based on information such as predetermined network loads. This sheds no light on how the network would adapt a beam based a predetermined

network load after the handoff decision (in the independent part of the claim) has already taken place.

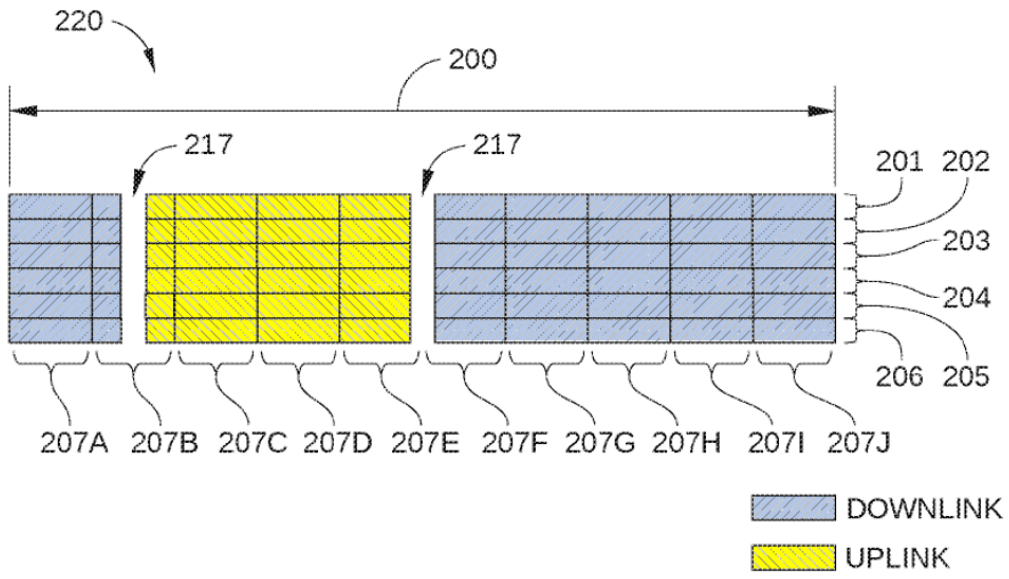
59. For these reasons, a POSITA would not understand "predetermined network load" in the context of the claim to have a plain and ordinary meaning and should be rendered indefinite.

C. The 361 Patent

60. The 361 Patent describes both FDD and TDD resource allocation schemes, though the claims are more relevant to TDD configurations as FDD systems typically are not reconfigured for the modification between uplink and downlink resources.

61. Figure 2B illustrates frequency spectrum resource allocation employing TDD. 361 Patent, 5:11-14.

361 Patent, Fig. 2B (annotated).



62. Like the figures addressed above, the blue resource blocks and subframes are allocated for downlink and the yellow ones for uplink.

63. The 361 patent states that is seeks to address a challenge of "efficient use of available wireless communication spectrum." 361 Patent, 1:19-24, 32-34. The 361 patent

acknowledges existing "communication schemes commonly used" "time-division duplex (TDD)" but this scheme "may typically be unable to employ all available frequency spectrum resources when uplink and downlink traffic is constantly changing." 361 Patent, 3:23-38.

64. The process to solve the purported identified problem is described in Figure 4:

361 Patent, FIG. 4 (annotated)

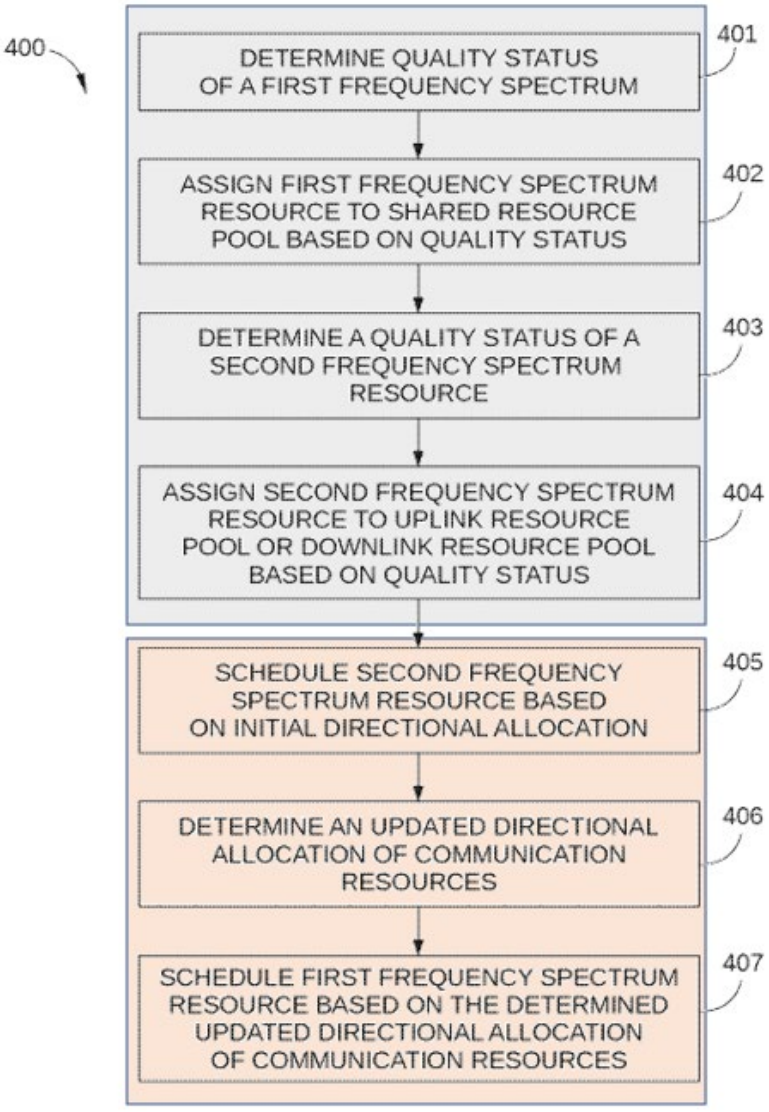


FIG. 4

65. The process occurs in two phases, which I have annotated in grey and orange.

66. In phase one (shaded in grey on top), the resources are measured and assigned based on their quality. In phase two (shaded on orange on bottom), the resources are scheduled based on "allocation determinations" (*e.g.*, traffic needs or interference measurements) in the network. 361 Patent, Fig. 4, 10:55-13:4.

67. Starting with phase one, in steps 401 & 403 shown in Figure 4, the method "obtain[s] the quality status of the current uplink and downlink frequency spectrum resources available (e.g., subcarriers 201-206) using quality status module 113." 361 Patent, 8:50-53. To obtain the quality of the signal, the 361 Patent states "that *determination of quality status*, as described above, can be performed *using information typically already measured by LTE and LTE-Advanced wireless communication systems*." 361 Patent, 8:53-64; 8:64-9:2. Two of the known measurement types already in use in LTE and LTE-A include measuring CQI on the downlink and RIP on the uplink. 361 Patent, 8:60-9:2; *see also id.,* 10:55-11:46.

68. Still in phase one, *in steps 402 and 404*, the method describes using "the quality status measured" to sort the resources into "pools." 361 Patent, 9:3-5 (emphasis added); *see also id*. 10:8-28. The first pool (identified in step 402) is labeled as the "shared resource pool." This pool is where the first frequency resource is assigned. 361 Patent, 11:28-32 (emphasis added). The 361 Patent describes how this shared pool is filled with resources that are measured to be "sub-optimal" for both downlink and uplink. 361 Patent, 11:28-32 (emphasis added). The second and third pools (identified in step 404) are labeled the (i) "downlink resource pool" and (ii) the "uplink resource pool." These pools are filled with resources that are measured to be most suitable for either the downlink (e.g., "high CQI") or uplink (e.g., "low RIP"), respectively. 361 Patent, 9:9-13, 11:4-38, 11:47-12:7.

69. In phase two *in step 405*, a scheduler schedules resources. The scheduler performs an "initial allocation" by scheduling the downlink resources from the downlink resource pool and the uplink resources from the uplink pool. 361 Patent, 9:30-40, 12:8-34.

70. *In step 406*, the scheduler performs an "updated directional allocation of frequency spectrum resources" based on the number of current resources requests, the current scheduling of uplink channels and downlink channels, and remaining resources not yet scheduled. 361 Patent, 9:47-63, 12:35-54.

71. *In step 407*, the resources are scheduled from the shared resource pool in either the uplink or downlink direction depending on what kind of resource is needed. 361 Patent, 12:55-62. "Consequently, frequency spectrum resources may be dynamically allocated to satisfy resource requests for node 110, so that very few or no frequency spectrum resources are idle." 361 Patent, 10:1-6, 12:55-13:4.

72. The 361 Patent also makes clear that "each individual [physical resource block] PRB" may constitute a frequency resource. 361 Patent, 10:29-38.

i. <u>"quality status module configured to determine a respective status of a first frequency spectrum resource and a second frequency spectrum resource" (Claim 10)</u>

Claim Term	Defendants' Construction	Cobblestone's Construction
"quality status module configured to determine a respective status of a first frequency spectrum resource and a second frequency spectrum resource" Claim 10	Means-plus-function term governed by § 112(f) **Function:** determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are	No construction necessary; plain and ordinary meaning; not indefinite under 35 U.S.C. § 112; not subject to means-plus-function treatment under 35 U.S.C. § 112(f).

	associated with an air interface that is available for use by the wireless base station for an uplink channel or a downlink channel **Structure:** Processor with software running an algorithm to execute measurement of "channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR), etc." 4:29-34	

73. I understand that the parties dispute the meaning of quality status module configured to determine a respective status of a first frequency spectrum resource and a second frequency spectrum resource," which appears in claim 10 of the 361 Patent.

74. I understand that the Plaintiff contends that this term should receive its plain and ordinary meaning, but "quality status module configured to determine a respective status of a first frequency spectrum resource and a second frequency spectrum resource" does not have a customary, or plain and ordinary, to one skilled in the art and the Plaintiff cites to no extrinsic evidence or support for any plain and ordinary construction.

75. I understand that the Defendants contend that this term should be construed under § 112, ¶ 6, which I further understand to govern "means-plus-function" terms. I understand that a means-plus-function term requires that a corresponding structure be disclosed in the specification

and also linked to the function, and that the corresponding structure be capable of performing the entirety of the function.

76. Having considered the parties' contentions, and based on my review of the claim language in the context of the specification and the prosecution history, it is my opinion that the term is functional in nature and a POSITA would understand the term as Defendants have proposed to construe it.

a) The "quality status module" term is a functional term

77. Claim 10 of the 361 Patent, which contains the "quality status module configured to determine a respective status of a first frequency spectrum resource and a second frequency spectrum resource" term, is reproduced below. (emphasis added).

> 10. A wireless base station for a wireless communication network, the wireless base station comprising:
>
> ***a quality status module configured to determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource***, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are associated with an air interface that is available for use by the wireless base station for an uplink channel or a downlink channel;
>
> a processor coupled to the quality status module and configured to:
>
> > determine, based on the quality status of the first frequency spectrum resource, that the first frequency spectrum resource is a sub-optimal resource, for the uplink channel and the downlink channel, relative to other frequency spectrum resources that are available for use by the wireless base station; and
> >
> > in response to the determination that the first frequency spectrum resource is the sub-optimal resource, assign the first frequency spectrum resource to a shared resource pool; and
>
> a scheduler module coupled to the processor and configured to:
> > schedule the second frequency spectrum resource for the uplink channel or the downlink channel based on an initial directional allocation of frequency spectrum resources for the wireless base station;

> determine an updated directional allocation of frequency spectrum resources for the wireless base station after the second frequency spectrum resource is scheduled for the uplink channel or the downlink channel; and
>
> schedule the first frequency spectrum resource based on the updated directional allocation of frequency spectrum resources for the wireless base station.

78. I understand that the Plaintiff does not identify any extrinsic evidence in its P.R. 4-2 disclosures that define the term "a quality status module configured to determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource" in the art at the time of patenting. "Module" is a generic description for software or hardware that operates as a "means" for performing the claimed determination function. In the context of the claim, "module" does not provide any indication of structure and sets forth a black box recitation of a structure for providing the claimed determination function as if the term "means" had been used. The prefix "quality status" does not impart any structure into the term "module." I have reviewed the specification and file history and nothing in the specification and prosecution history convey additional structure. For example, the "quality status module 113" is described as "suitably configured software, firmware, or logic circuit entity, etc." 361 Patent, 10:56-58.

79. Thus, in my opinion "quality status module configured to determine a respective status of a first frequency spectrum resource and a second frequency spectrum resource" is a purely functional term.

b) The "quality status module term" should be construed according to the clearly defined claim language and associated disclosures

80. A POSITA would understand that the function of the "quality status module" is to "determine a respective quality status of a first frequency spectrum resource and a second frequency spectrum resource, wherein each of the first frequency spectrum resource and the second frequency spectrum resource are associated with an air interface that is available for use by the

wireless base station for an uplink channel or a downlink channel," as the claim language expressly defines.

81. The specification supports this functional understanding. *See, e.g.,* 361 Patent 1:62-2:3 ("The quality status module is configured to determine a quality status of a first frequency spectrum resource associated with an air interface that is available for use by the wireless base station for an uplink channel or a downlink channel, and to determine a quality status of a second frequency spectrum resource associated with the air interface that is available for use by the wireless base station for an uplink channel or downlink channel."); 4:19-24 ("[A] quality status module 113 configured to ***determine a quality status*** of frequency spectrum resources associated with air interface 130 that are available for use by node 110 for an uplink or downlink channel."); 10:55-61 (same); 11:18-19 ("[T]he first frequency spectrum resource may be determined by quality status module 113 . . .").

82. A POSITA would look to the specification to obtain clarity and a more specific identification of the structure of the "module." Based on the specification, a POSITA would recognize that the structure is a processor with software running an algorithm to execute measurement of "channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR), etc." 361 Patent, 4:29-34. This algorithmic structure is expressly disclosed throughout the specification as the algorithm of the software of the "quality status module" for performing the claimed determination function. *See* 361 Patent, 8:53-60 ("[Q]uality status module 113 may acquire suitability of some or all of subcarriers 201-206 for uplink channels ***by measurement of RIP*** for each of subcarriers 201-206.

To acquire suitability of some or all of subcarriers 201-206 for downlink channels, node 110 ***may measure CQI***, for example ***through the measurement of reference signal received power (RSRP) and received signal strength indicator (RSSI)***."); 361 Patent, 9:3-5 ("[N]ode 110 may sort the available frequency spectrum resources ***based on the quality status measured for each***."); 361 Patent, 9:3-29 (explaining that the frequency spectrum resources are based on the measured quality status, providing examples that contextualize how the measured CQI and RPI values effect assigning the frequency spectrum resources into suitable resource pools); 361 Patent, 10:61-11:1 (same); 11:18-46 (same).

83. Thus, to better help the jury understand the specifically disclosed structure for performing the quality status determination function, this term should be construed as a means-plus-function term where the function is defined in the claim and the specific structure for implementing the necessary function is a processor with software running an algorithm to execute measurement of channel quality indicator (CQI), received interference power (RIP), and/or any other suitable quality metric or key performance indicator, such as RSSI, acknowledgment/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR), etc. 361 Patent, 4:29-34.

ii. <u>"shared resource pool" (Claims 10, 11, 17)</u>

Claim Term	Defendants' Construction	Cobblestone's Construction
"shared resource pool" Claims 10, 11, 17	A pool containing sub-optimal frequency spectrum resources that can be scheduled for uplink and downlink channels	No construction necessary; plain and ordinary meaning

84. I understand that the parties dispute the construction of "shared resource pool," which appears in claims 10, 11, and 17 of the 361 Patent. I understand that the Plaintiff contends

that this term should receive its plain and ordinary meaning. I understand that the Defendants contend that this term should be construed as "a pool containing sub-optimal frequency spectrum resources that can be scheduled for uplink and downlink channels." Having considered the parties' contentions, and based on my review of the patent claims, specification, and prosecution history, in my opinion a POSITA would understand the term as Defendants have proposed to construe it.

85. The specification of the 361 Patent repeatedly describes three pools: "a downlink resource pool , an uplink resource pool , or a shared resource pool." 361 Patent at Abs.; see also Fig. 1 ("downlink resource pool," "uplink resource pool," and "shared resource pool"); Fig. 4 ("shared resource pool," "uplink resource pool," and "downlink resource pool"); 4:14-16 ("[A] downlink resource pool 116, an uplink resource pool 117, and a shared resource pool 118."); 4:55-56 ("[A] downlink resource pool 116, an uplink resource pool 117, and a shared resource pool 118."); 10:35-37 ("[A] downlink resource pool 116, an uplink resource pool 117, and/or a shared resource pool 118.").

86. The 361 Patent repeatedly explains that resources are assigned to one of the three pools based on the determined quality status of the resource: "processor module 112 may assign high-quality resources to downlink resource pool 116 and/or to uplink resource pool 117, and may assign lower-quality frequency spectrum resources to shared resource pool 118." 361 Patent at 9:5-8. As other examples:

> For example, in some embodiments, subcarriers with high CQI, which may indicate that the subcarrier is well-suited for a downlink channel, may be assigned to downlink resource pool 116, and subcarriers with low RIP, which may indicate that the subcarrier is well-suited for an uplink channel, may be assigned to uplink resource pool 117.

361 Patent, 9:8-14.

> In block 404, ("Assign second frequency spectrum resource to uplink resource pool or downlink resource pool based on quality status"), processor module 112 (or any other suitably configured software,

> firmware, or logic circuit entity, etc.) may assign the second frequency spectrum resource to downlink resource pool 116 and/or to uplink resource pool 117 based on the quality status determined in block 403. For example, in response to the quality status of the second frequency spectrum resource being indicative that the second frequency spectrum is usable for an uplink channel, processor module 112 may assign the second frequency spectrum resource to uplink resource pool 117. In some embodiments, the second frequency spectrum resource may be "usable for an uplink channel" when the quality status meets or exceeds a particular threshold, such as when an RIP value associated with the second frequency spectrum resource is equal to or less than a specified maximum value or some other value. Similarly, in response to the quality status of the second frequency spectrum resource being indicative that the second frequency spectrum usable for a downlink channel, processor module 112 may assign the second frequency spectrum resource to downlink resource pool 116. In some embodiments, the second frequency spectrum resource may be "usable for a downlink channel" when the quality status meets or exceeds a particular threshold, such as when a CQI value associated with the second frequency spectrum resource is equal to or greater than a specified minimum value or some other value.

361 Patent, 11:47-12:7.

87. Thus, a POSITA would have recognized that "sub-optimal" resources—to the extent that term can be understood—are resources assigned to the shared resource pool.

88. Next, a POSTIA would have recognized that in all instances the resources placed into the shared resource pool can be scheduled for uplink and downlink channels based on the directional needs of the base station:

> scheduler module 114 (or any other suitably configured software, firmware, or logic circuit entity, etc.) may select the *first frequency spectrum resource from shared resource pool* 118 and may schedule the first spectrum *for either an uplink channel or a downlink channel*.

361 Patent, 12:57-61.

> a method for a base station of a wireless network to allocate communication resources between uplink and downlink channels comprises determining a quality status of a first frequency spectrum resource *that is available for use by the base station for an uplink or downlink channel; assigning the first frequency spectrum resource to*

> *a shared resource pool* based on the determined quality status of the first frequency spectrum resource;

361 Patent, 1:39-46.

> selecting the first frequency spectrum resource from the shared resource pool and scheduling the first frequency spectrum resource for either the uplink channel or the downlink channel

361 Patent, cl. 1.

> scheduler module 114 may schedule one or more frequency spectrum resources assigned to shared resource pool 118 *for uplink and/or downlink channels*.

361 Patent, 9:66-10:1.

> a particular frequency spectrum resource assigned to shared resource pool 118 may be scheduled by scheduler module 114 of node 110 *for an uplink or a downlink channel*

361 Patent, 10:8-11.

> For example, a frequency spectrum resource assigned to shared resource pool 118 may be scheduled by scheduler module 114 of node 110 for a downlink channel when the frequency spectrum resource has a higher CQI than other frequency spectrum resources assigned to shared resource pool 118. Similarly, a frequency spectrum resource assigned to shared resource pool 118 may be scheduled by scheduler module 114 of node 110 for an uplink channel when the frequency spectrum resource has a lower RIP than other frequency spectrum resources assigned to shared resource pool 118.

361 Patent, 10:13-23.

> Thus, because the first frequency spectrum resource is determined by quality status module 113 to currently be a sub-optimal resource for uplink and/or downlink channels, the first frequency spectrum resource may be assigned by processor module 112 to shared resource pool 118. The *first frequency spectrum resource may subsequently be scheduled by scheduler module 114 (see block 407) for an uplink or a downlink channel*

361 Patent, 11:28-35.

89. A POSITA reading the specification of the 361 Patent would understand the purpose of determining the quality status of the resource and sorting it into three pools is to improve "the

efficient use of available wireless communication spectrum." 361 Patent, 1:31-33. By allocating high quality resources to uplink or downlink in an "initial directional allocation" and then allocating the remaining resources to either an uplink or a downlink channel based on "updated directional needs," resources can be allocated on either the uplink or downlink channel depending on where the resource is needed.

90. However, uplink resource pool and downlink resource pool are not claimed terms. Instead, the only pool that is claimed is the shared pool. A POSITA would have recognized that "shared" is a relative term because there's no indication in the claim between "what" resource is shared. A POSITA would have recognized that, without context of the specification, a "shared" resource could be shared among items other than an uplink and downlink channel, which would defeat the entire purpose of the patent. 361 Patent, 9:66-10:1; 9:58-63 ("[T]he updated directional allocation of frequency spectrum resources may be based on the remaining resource requests (***for both uplink and downlink channels***) that are not yet satisfied after scheduling frequency spectrum resources assigned to downlink resource pool 116 ***and to*** uplink resource pool 117."). Thus, a shared resource pool should be construed as "a pool containing sub-optimal frequency spectrum resources that can be scheduled for uplink and downlink channels."

iii. <u>"sub-optimal resource" (Claims 10, 17)</u>

Claim Term	Defendants' Construction	Cobblestone's Construction
"sub-optimal resource" Claims 10, 17	Indefinite	No construction necessary; plain and ordinary meaning; not indefinite under 35 U.S.C. § 112.

91. I understand that the parties dispute the construction of "sub-optimal resource" which appears in claims 10 and 17 of the 361 Patent and require "determin[ing] based on the quality status of the first frequency spectrum resource, that the first frequency spectrum resource

is a ***sub-optimal resource***, for the uplink channel and the downlink channel, relative to other frequency spectrum resources that are available for use by the wireless base station." 361 Patent, claims 10, 17.

92. "Sub-optimal resource" is a term of degree. The patent specification and claims provide no guidance about the scope of the term, and the specification does not provide any express definition or objective boundary that would enable a POSITA to determine what falls within the scope of a "sub-optimal resource."

93. I understand that the Plaintiff contends that this term should receive its plain and ordinary meaning, but "sub-optimal resource" is not a term that would be readily understood by a POSITA and the Plaintiff offers no definition or evidence illustrating that what the plain meaning is.

94. The only disclosure of "sub-optimal resource" merely describes how "suitable" a resource is as compared to one or more other resources. First, the specification explains (referring to Figure 4) that in block 401 the "quality status module 113" determines "a quality status of a first frequency spectrum resource" by measuring the CQI value of the resource, the RPI value of the resource, or both. 361 Patent, 10:55-11:1. Subsequently, in block 402, the resource may be assigned to "shared resource pool 118, based on the quality status of the first frequency spectrum resource determined in block 401." 361 Patent, 11:4-10. The resource is assigned to "shared resource pool 118 when it is determined [to be] *less suitable for an uplink channel than one or more other frequency spectrum resources [] and also is less suitable for a downlink channel than one or more frequency spectrum resource* that are available to node 110" presumably making the resource "sub-optimal." 361 Patent, 11:10-17; *see also id*. at 11:28-33 ("[B]ecause the first frequency spectrum resource is determined by quality status module 113 to currently be a sub-

optimal resource for uplink and/or downlink channels, the first frequency spectrum resource may be assigned by processor module 112 to shared resource pool 118.").

95. Regarding "suitability," the written description explains that a resource is "*less suitable*" if its CQI and/or RIP is "*less than*" a CQI and/or RIP of "one or more other frequency spectrum resources." 361 Patent, 11:18-28. This description provides no objective basis or boundary to determine which resource is optimal versus which resource is suboptimal.

96. Alternatively, the 361 Patent suggests a resource could be optimal or suboptimal "when the quality status meets or exceeds a particular threshold, such as when an RIP value associated with the second frequency spectrum resource is equal to or less than a specified maximum value or some other value." 361 Patent at 11:58-64; 11:64-7 ("[W]hen the quality status meets or exceeds a particular threshold, such as when a CQI value associated with the second frequency spectrum resource is equal to or greater than a specified minimum value or some other value."). The patent, however, provides no objective basis or standard for this "maximum value or some other value" threshold. A POSITA reading this disclosure would likewise be unable to determine where an optimal resource stops and a sub-optimal resource begins.

97. Moreover, the 361 Patent does not even limit the quality measurement to CQI or RIP. The 361 Patent instead expands the manner in which quality can be measured to include other metrics in the network: "quality status module 113 may determine the quality status of each frequency spectrum resources associated with air interface 130 based on channel quality indicator (CQI), received interference power (RIP), ***and/or any other suitable quality metric or key performance indicator***, such as RSSI, acknowledgement/negative acknowledgement (ACK/NACK) frequency, dropping rate, block error rate, bit error rate, signal-to-interference-plus-noise ratio (SINR), ***etc.***" 361 Patent at 4:26-34. Although a POSITA reading this description would

recognize these metrics, in general, a POSITA would not be able to form an objective boundary as to what is "optimal" or what is "sub-optimal" because the 361 Patent does not provide any objective number or threshold to distinguish between those two concepts as it relates to any of these other metrics.

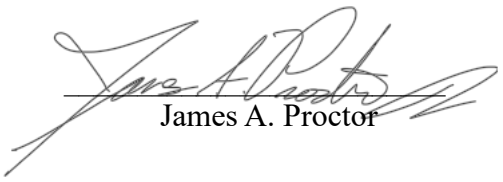
98. A POSITA would not be informed with reasonable certainty about the scope of "sub-optimal resource" for several additional reasons. For example, (1) it is not clear how much "less" a first CQI and/or RIP value must be in comparison to another resource's CQI and/or RIP (or any other metric disclosed in the 361 Patent specification) for the first resource to be "sub-optimal;" (2) it is not clear how many resources a first resource should be compared to determine whether it is a "sub-optimal resource" (*e.g.*, there's no disclosure of whether it suboptimal after one comparison, two comparisons, three comparisons, etc.); (3) it is not clear whether a first resource would be "sub-optimal" if, for instance, it has a higher CQI and a lower RIP than a second resource, or vice versa; and (4) it is not clear whether a first resource is "sub-optimal" in a use case where it has *lower* measurements than a second resource, but *higher* measurement than a third resource. In such a scenario, the resource would be considered both "optimal" and "sub-optimal" depending on what other resource its being compared to. The scope is made more unclear by the plain language, which states that a first resource can be assigned "shared resource pool 118" based on being "less suitable" for ***both*** a downlink and uplink channel, but then postures that it can be determined to be a "sub-optimal resource "for uplink ***and/or*** downlink channels." 361 Patent, 11:28-31.

99. "Sub-optimal resource" varies across changing circumstances and changes based on several other parameters. A POSITA would not be able readily ascertain the scope of the term,

particularly where the intrinsic record does not disclose objective boundaries for determining when a resource is "less suitable" or "sub-optimal" or any guidance regarding the same.

100. Thus, in my opinion, a POSITA would not be reasonably informed about the scope of "sub-optimal resource."

Executed this 12th day of March, 2024.



James A. Proctor